In the Claims

Listing of claims:

1. (Currently amended) Method for continuously manufacturing EL lamp material comprising the steps of:

providing a front electrode laminate comprising the steps of:

providing a continuous coil of indium tin oxide coated polyester (ITO/PET) film;

applying an organic binder to the indium tin oxide (ITO) surface of the ITO/PET film by means of a roller, ~~coating a continuous coil of an indium tin oxide polyester film (ITO/PET) substrate with an organic binder~~ and

depositing a mono-layer of phosphor particulate onto the organic binder defining a front ~~substrate~~ electrode laminate;

providing a rear electrode laminate comprising the steps of:

providing ~~coating~~ a continuous coil of an aluminum foil polyester film, and ~~laminate with~~ applying a layer of barium titanate to the aluminum foil surface of the aluminum foil polyester film defining a rear ~~substrate~~ electrode laminate;

continuously ~~laminating~~ joining said front ~~substrate~~ electrode laminate and said rear ~~substrate~~ electrode laminate with said organic binder phosphor particulate layer facing said barium titanate layer to produce ~~an~~ a continuous roll of EL lamp laminate material having an ITO front electrode and an aluminum foil rear electrode.

2. (Currently amended) The method as defined in claim 1, wherein the step of providing a front electrode laminate ~~coating the ITO/PET substrate~~ includes the steps of:

applying an organic binder comprising ~~coating the ITO surface of the ITO/PET substrate with~~ a UV-curable organic binder to the ITO surface of the ITO/PET film;

electrostatically depositing a mono-layer of phosphor particulate on the UV-curable organic binder surface wherein the phosphor particulate is partially embedded in the organic binder; and

setting the thickness of the UV-curable organic binder phosphor particulate layer to a predetermined desired thickness.

3. (Currently amended) The method as defined in claim 2, further including the step of curing the UV-curable organic binder phosphor particulate layer prior to the step of laminating the front and rear ~~substrate~~ electrode laminates.

4. (Original) The method as defined in claim 2, further including the step of partially curing the UV-curable organic binder phosphor particulate layer prior to setting the thickness of the layer.

5. (Currently amended) The method as defined in claim 1, wherein the step of providing a front electrode laminate ~~coating the ITO/PET substrate~~ includes the steps of:

~~coating the ITO surface of the ITO/PET substrate with~~ applying a slurry mixture of a UV-curable organic binder and phosphor particulate to the ITO surface of the ITO/PET film; and

setting the thickness of the UV-curable organic binder and phosphor particulate layer to a predetermined desired thickness.

6. (Currently amended) The method as defined in claim 5, further including the step of curing the UV-curable organic binder phosphor particulate layer prior to the step of laminating the front and rear ~~substrates~~ electrode laminates.

7. (Currently amended) The method as defined in claim 5, further including the step of curing the UV-curable organic binder phosphor particulate layer after the step of laminating the front and rear ~~substrates~~ electrode laminates.

8. (Currently amended) The method as defined in claim 1, wherein the step of continuously ~~laminating~~ joining said front and rear ~~substrates~~ electrode laminates further includes embedding exposed portions of the phosphor particulate extending beyond the surface of the organic binder in the barium titanate layer.

9. (Currently amended) The method as defined in claim 1, wherein the step of continuously ~~laminating~~ joining said front and rear ~~substrates~~ electrode laminates further includes setting the thickness of the EL lamp laminate material to a predetermined desired thickness.

10. (Currently amended) The method as defined in claim 1, wherein the step of providing a front electrode laminate ~~coating the continuous coil ITO/PET substrate~~ includes the steps of:

~~coating the ITO surface of the ITO/PET substrate with~~ applying a thermoplastic clear organic binder to the ITO surface of the ITO/PET film;

setting the thickness of the thermoplastic clear organic binder layer to a predetermined desired thickness;

warming the thermoplastic organic binder layer to soften it;

electrostatically depositing a mono-layer of phosphor particulate on the softened thermoplastic organic binder surface; and

chilling the thermoplastic organic binder phosphor particulate layer to firm it prior to the ~~laminating~~ step of joining the front and rear electrode laminates.

11. (Currently amended) Apparatus for continuously manufacturing electroluminescent (EL) lamp ~~laminate~~ material comprising:

~~means~~ a first roller for ~~coating~~ applying an organic binder to the indium tin oxide (ITO) surface of a continuous coil of an indium tin oxide polyester (ITO/PET) ~~film substrate with a layer of an organic binder~~;

~~means~~ a phosphor particulate deposition station for depositing a mono-layer of phosphor particulate on said organic binder, said phosphor particulate organic binder coated ITO/PET film ~~substrate~~ defining a front ~~substrate~~ electrode laminate;

~~means~~ a second roller for applying a barium titanate layer to the aluminum foil surface of ~~coating~~ a continuous coil of an aluminum foil polyester film ~~with a barium titanate layer~~, said barium titanate coated aluminum foil polyester film defining a rear ~~substrate~~ electrode laminate; and

~~means~~ a laminating nip for ~~laminating~~ joining said front ~~substrate~~ electrode laminate and said rear ~~substrate~~ electrode laminate passing through said nip with said organic binder phosphor particulate layer facing said barium titanate layer to produce a continuous ~~coil~~ roll of EL lamp laminate material having an ITO front electrode and an aluminum foil rear electrode.

12. (Currently amended) The apparatus as defined in claim 11, wherein said first roller ~~ITO/PET coating means~~ further comprises a gravure roller for applying the organic binder layer to the ITO surface.

13. (Currently amended) The apparatus as defined in claim 11, wherein said first roller ~~ITO/PET coating means~~ applies a UV-curable organic binder layer to the ITO surface.

14. (Currently amended) The apparatus as defined in claim 13, wherein said phosphor particulate ~~depositing means~~ deposition station further comprises a phosphor particulate deposition station electrostatic depositing means.

15. (Currently amended) The apparatus as defined in claim 11, further including a calender roll for setting the thickness of said front ~~substrate~~ electrode laminate to a predetermined desired thickness.

16. (Currently amended) The apparatus as defined in claim 11, wherein said first roller ~~ITO/PET coating means~~ further comprises a knife-over-roll apparatus for applying a slurry mixture of a UV-curable organic binder and phosphor particulate to the ITO surface of the ITO/PET film.

17. (Currently amended) The apparatus as defined in claim 13, further including ~~the means for curing the UV organic binder is~~ a UV-organic binder curing station located prior to said laminating ~~means~~ nip.

18. (Currently amended) The apparatus as defined in claim 13, further including ~~the means for curing the UV organic binder is~~ a UV-organic binder curing station located after said laminating ~~means~~ nip.

19. (Currently amended) The apparatus as defined in claim 11, wherein said laminating ~~means~~ nip comprises a pressure-nip laminator.

20. (Currently amended) The apparatus as defined in claim 11, wherein said laminating ~~means~~ nip comprises a heated-nip laminator.

21. (Currently amended) Method for continuously manufacturing electroluminescent (EL) lamp material comprising the steps of:

providing a front electrode laminate comprising the steps of:

providing a continuous roll of an indium tin oxide coated polyester (ITO/PET) film ~~ITO/PET substrate~~ of indeterminate length and width;

~~coating~~ applying a UV-curable organic binder to the indium tin oxide (ITO) surface of ~~said~~ the ITO/PET ~~substrate~~ film ~~with a UV curable organic binder layer~~ by means of a roller;

depositing a mono-layer of phosphor ~~particles~~ particulate onto ~~in~~ the UV-curable organic binder layer;

partially curing ~~said~~ the phosphor ~~particle~~ particulate deposited UV-curable organic binder layer;

setting ~~said~~ the UV-curable organic binder phosphor ~~particle~~ particulate layer to a predetermined desired thickness; and

curing ~~said~~ the UV-curable organic binder phosphor ~~particle~~ particulate particulate layer~~;~~ ~~said ITO/PET cured organic binder phosphor particle substrate defining a front electrode laminate~~;

providing a rear electrode laminate comprising the steps of:

providing a continuous roll of an aluminum foil polyester film ~~laminate~~ of indeterminate length and having a width substantially equal to the width of ~~said~~ the ITO/PET ~~substrate~~film;

~~coating~~ applying a layer of barium titanate to the aluminum foil surface of ~~said~~ the aluminum foil polyester ~~film laminate with a barium titanate layer, said barium titanate coated aluminum foil polyester film laminate defining a rear electrode laminate~~; and

continuously joining said front electrode laminate and said rear electrode laminate with said organic binder phosphor ~~particle~~ particulate layer facing said barium titanate layer to produce a continuous roll of EL lamp laminate material having an ITO front electrode and an aluminum foil rear electrode.

22. (Currently amended) The method as defined in claim 21, further including the step of removing foreign matter from the indium tin oxide (ITO) surface prior to ~~coating with~~ applying the UV-curable organic binder layer.

23. (Currently amended) The method as defined in claim 21, wherein the step of ~~coating~~ applying the UV-curable organic binder further includes applying the UV-curable organic binder using a direct gravure roller ~~coating onto the indium tin oxide surface~~.

24. (Currently amended) The method as defined in claim 21, wherein the step of ~~coating~~ applying the UV-curable organic binder layer further includes applying the UV-curable organic binder using an indirect gravure roller ~~coating onto the indium tin oxide surface~~.

25. (Currently amended) The method as defined in claim 21, wherein the step of ~~coating~~ applying the UV-curable organic binder ~~layer~~ further comprises ~~coating~~ applying the UV-curable organic binder ~~layer~~ in a thickness in the range of about 0.3 mils to 0.8 mils.

26. (Currently amended) The method as defined in claim 21, wherein the step of depositing a mono-layer of phosphor ~~particles~~ particulate further includes the step of electrostatically depositing phosphor ~~particles~~ particulate of like electrical polarity charge onto the surface of the UV-curable organic binder ~~layer~~.

27. (Currently amended) The method as defined in claim 26, further including discharging the electrical charge from the phosphor ~~particles~~particulate electrostatically deposited on the UV-curable organic binder ~~layer~~ surface.

28. (Currently amended) The method as defined in claim 26, wherein the step of depositing a mono-layer of phosphor ~~particles~~ particulate further includes depositing phosphor ~~particles~~ particulate having a microencapsulated inorganic coating.

29. (Original) The method as defined in claim 28, wherein the microencapsulated inorganic coating is aluminum oxide.

30. (Original) The method as defined in claim 28, wherein the microencapsulated inorganic coating is aluminum nitride.

31. (Currently amended) The method as defined in claim 21, wherein the step of setting the thickness of ~~said~~ the UV-curable organic binder phosphor ~~particle~~ particulate layer further includes passing the partially cured organic binder phosphor ~~particle~~ particulate layer ITO/PET ~~substrate~~ film through at least one calender roll.

32. (Currently amended) The method as defined in claim 31, further including the step of heating the calender roll to soften the partially cured UV-curable organic binder to more easily reposition the phosphor ~~particles~~particulate.

33. (Currently amended) The method as defined in claim 21, wherein the step of ~~coating~~ applying the UV-curable organic binder further comprises ~~coating with~~ applying a clear, UV-curable organic binder.

34. (Currently amended) The method as defined in claim 32, wherein the UV-curable organic binder is moisture resistant.

35. (Currently amended) The method as defined in claim 33, wherein the UV-curable organic binder has a dielectric constant in the range of about greater than 4, a dissipation factor in the range of about less than 0.125, and a dielectric strength in the range of about 1000 +/- 200 volts per mil.

36. (Currently amended) The method as defined in claim 21, wherein the step of continuously joining the front and rear ~~electrodes~~ electrode laminates further comprises passing the front and rear ~~electrodes~~ electrode laminates through a nip laminator.

37. (Original) The method as defined in claim 36, further comprising the step of heating the nip laminator.

38. (Original) The method as defined in claim 21, further comprising the steps of:

cutting the rear electrode laminate into at least one pair of parallel strips; and

continuously joining said front electrode laminate and said parallel strip pair of rear electrode laminate to produce a continuous roll of split-electrode EL lamp laminate material.

39. (Currently amended) The method as defined in claim 21, further comprising the steps of:

cutting the rear electrode laminate into at least two pairs of parallel strips;

continuously joining said front electrode laminate and said at least two pairs of parallel strips rear electrode laminate; and

cutting the continuously joined front and rear electrode laminate along a line defined by adjacent pairs of parallel strips of rear electrode laminate to produce continuous ~~roll~~ rolls of split-electrode EL lamp laminate material wherein each continuous roll ~~corresponding~~ corresponds to each pair of parallel rear electrode laminate strips.

40. (Currently amended) An electroluminescent (EL) lamp material comprising:

a front electrode laminate comprising:

~~an indium tin oxide layer coated on~~ a continuous coil of indium tin oxide coated polyester (ITO/PET) film~~,~~;

-an organic binder layer ~~coated~~ on ~~said~~ the indium tin oxide surface of said ITO/PET film ~~layer~~, and

-a mono-layer of phosphor ~~particles~~ particulate ~~deposited~~ on said organic binder layer;

a rear electrode laminate comprising:

-a continuous coil of an aluminum foil polyester film;

~~and~~ a barium titanate layer ~~coated~~ on ~~said~~ the aluminum foil surface of said aluminum foil polyester film; and

~~a continuous coil laminate of~~ wherein said front electrode laminate and said rear electrode laminate are continuously joined with~~,~~ said organic binder phosphor particulate layer facing said barium titanate layer to form ~~the~~ a continuous roll of EL lamp laminate material having an ITO front electrode and an aluminum foil rear electrode.

41. (Currently amended) The EL lamp material as defined in claim 40, wherein said organic binder is a UV-curable organic binder ~~and said organic binder-phosphor particle layer is set to a predetermined thickness prior to laminating said front and rear electrode laminates~~.

42. (Currently amended) The EL lamp material as defined in claim 40, wherein said EL lamp material further comprises said rear electrode being cut to a predetermined depth through said aluminum foil polyester film and partially into said barium titanate layer to produce at least two electrically isolated rear electrode areas defining a continuous roll of a split-electrode EL lamp ~~having at least two electrically isolated rear electrode areas~~.

43. (Currently amended) The EL lamp material as defined in claim 42, further comprising said rear electrode being cut to a predetermined depth through said aluminum foil polyester film and partially into said barium titanate layer to produce at least two electrically isolated rear electrodes of equal area defining a continuous roll of a split-electrode EL lamp ~~having at least two electrically isolated rear electrodes of equal area to emit~~ wherein each area emits light of substantially equal brightness.

44. (Currently amended) The EL lamp material as defined in claim 42, further comprising said rear electrode being cut to a predetermined depth through said aluminum foil polyester film and partially into said barium titanate layer to produce at least two electrically isolated rear electrodes of unequal area defining a continuous roll of a split-electrode EL lamp ~~having at least two electrically isolated rear electrodes of equal area to emit~~ wherein each area emits light of unequal brightness.

45. (Currently amended) The EL lamp material as defined in claim 42, further comprising said rear electrode having multiple cuts to a predetermined depth through said aluminum foil polyester film and partially into said barium titanate layer to produce multiple pairs of electrically isolated rear electrode areas defining a continuous roll of a split-electrode EL lamp ~~having multiple pairs of electrically isolated rear electrode areas~~ wherein light is emitted in the area of each pair of multiple pairs to produce special effect lighting.

46. (Original) The EL lamp material as defined in claim 42, further comprising each of said at least two electrically isolated rear electrode areas having an electrical connector in contact with said aluminum foil for powering the EL lamp.

47. (Currently amended) The EL lamp material as defined in claim 40, wherein said EL lamp material further comprises said laminate having dual scribe lines along a marginal

peripheral region cut to predetermined depths through said laminate, wherein the first scribe line of said dual scribe lines is outward of the second scribe line of the dual scribe lines and is cut completely through said rear electrode laminate and said phosphor particle organic binder layer terminating at said indium tin oxide layer, and the second of said dual scribe lines cut to a predetermined depth through said aluminum foil polyester film and partially into said barium titanate layer to produce a parallel-plate EL lamp.

48. (Original) The EL lamp material as defined in claim 47, wherein the laminate region between the first scribe line and the laminate outer peripheral edge further includes an electrical connector through said laminate and in electrical contact with said indium tin oxide for powering said front electrode defining one plate of the parallel plate EL lamp.

49. (Original) The EL lamp material as defined in claim 47, wherein the laminate region between the second scribe line and the laminate outer peripheral edge opposite said laminate outer peripheral edge outward of said first scribe line further includes an electrical connector through said laminate and in electrical contact with said aluminum foil for powering said rear electrode defining the other plate of the parallel plate EL lamp.

50. (Original) The EL lamp material as defined in claim 47, further comprising said first scribe line being flooded with a conductive material.

51. (New) The EL lamp material as defined in claim 41 wherein said UV-curable organic binder phosphor particulate layer is set to a predetermined thickness.

52. (New) The EL lamp material as defined in claim 42 wherein said continuous roll of said split-electrode EL lamp material is cut to provide an EL lamp having a desired size and shape.

53. (New) The electroluminescent (EL) lamp material defined in claim 40 made in accordance with the method of claim 1.

54. (New) The electroluminescent (EL) lamp material defined in claim 40 made in accordance with the apparatus of claim 11.

55. (New) The method as defined in claim 1 for continuously manufacturing EL lamp material as defined in claim 40 made in accordance with the apparatus of claim 11.